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10/566,950	02/03/2006	Harunori Narihiro	053673-0028	3048
20277 7590 08/06/2008 MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096				
EXAMINER				
NELSON, MICHAEL E				
ART UNIT		PAPER NUMBER		
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MAIL DATE		DELIVERY MODE		
08/06/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/566,950

Applicant(s)

NARIHIRO ET AL.

Examiner

MICHAEL E. NELSON

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☒ Claim(s) 4-7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF 298)
Paper No(s)/Mail Date 02/03/2008
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities:
2. Claim 1 is not a single sentence. The period at the end of the first sentence (amino group containing unit.) should be removed, and the claim worded appropriately.
3. In claim 1, the parenthesis around the description of substituent R⁸ should be removed, and the claim worded to describe substituent R⁸ in the text of the claim. The parenthesis makes the claim unclear whether the information within the parenthesis is exemplary or optional, or an actual claim limitation.
4. Appropriate correction is required.
5. Claims 4-7 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should not depend from another multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 4-7 have not been further treated on the merits.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

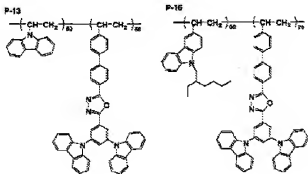
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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Taguchi (JP 2002302516).

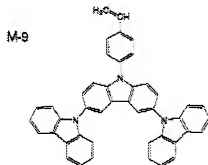
8. Concerning claims 1 and 2, Taguchi describes copolymer materials (page 10) such as those shown below, where the residue according to Applicant's formula [2] is a carbazole according to Applicant's formula [3] (per claim 2). The amino group containing unit is the vinyl carbazole co-monomer shown in the structures below. Structural feature A is an ethylene backbone, while structural feature B is a conjugated series of 4 aromatic or heteroaromatic groups, in the case of the specific copolymer shown below, in the order of phenylene, phenylene, oxadiazolyl, phenylene (the final phenylene is substituted).



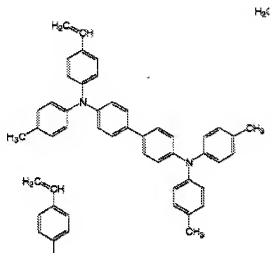
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9. Claims 1-2 are rejected under 35 U.S.C. 102(a) as being anticipated by Watanabe et al. (JP 2004-018787).

10. Concerning claims 1-2, Watanabe et al. describe polymer materials (page 10) having a monomer unit having the structure (M-9) such as the one shown below. In this case, Applicant's subunit C is a carbazole according to Applicant's formula [3] (per claim 2), and subunit B includes two groups bonded to each other, the first (phenylene) and second (carbazolyl, heteroaromatic), where the second group is substituted.



11. Watanabe et al. further discloses that the polymer may be copolymeric with a second monomer unit [0047]-[0048], and discloses a handful of preferred co-monomers, including the structure shown below. [0054]



12. Given the explicit teaching of copolymeric materials, and the explicit teaching of a limited number of preferred co-monomers, including the structure shown above, one of ordinary skill would immediately envisage the copolymer with the two monomer units described above.

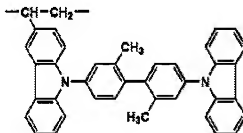
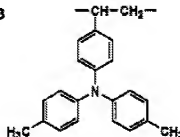
13. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

14. Claims 1-2 are rejected under 35 U.S.C. 102(a) as being anticipated by Kita et al. (JP 2004185967).

15. Concerning claims 1-2, Kita et al. describe the copolymer material having the monomer units shown below (A-13 and B-3) (see polymer 1-4, table 1, page 42). In this case Applicant's subunit C is represented by a carbazole according to Applicant's formula [3] (per claim 2), while the amine containing unit is the triphenylamine monomer

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shown below. Applicant's subunit B is represented by 3 (two or more) groups, in this case carbazole (heteroaromatic), and two phenylene groups.

A-13**B-3**

16. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

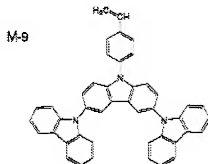
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (JP 2004-018787).

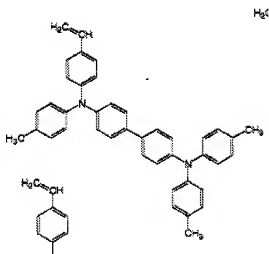
19. Concerning claims 1-2, Watanabe et al. describe polymer materials having a monomer unit having the structure (M-9) such as the one shown below. In this case, Applicant's subunit C is a carbazole according to Applicant's formula [3] (per claim 2),

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and subunit B includes two groups bonded to each other, the first (phenylene) and second (carbazolyl, heteroaromatic), where the second group is substituted.



20. Watanabe et al. further discloses that the polymer may be copolymeric with a second monomer unit [0047]-[0048], and discloses a handful of preferred co-monomers, including the structure shown below. [0054]

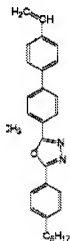


21. Watanabe et al. are silent on a specific example of a copolymer having the two monomers shown above, but given the explicit teaching of copolymeric materials, and the explicit teaching of a limited number of preferred co-monomers, including the

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structure shown above, it would have been obvious to one of ordinary skill to make the copolymer with the two monomer units described above.

22. Concerning claim 3, Watanabe et al. describes the copolymer materials discussed above, but further state that the copolymer can include two **or more** monomers. Watanabe et al. are silent on the use of a further oxadiazole monomer in the copolymer material. Watanabe et al. further disclose other monomer units, such as the one shown below, [0054] and disclose that oxadiazole structures shown electron transporting ability [0052]. It is well known in the art to include electron transporting monomer units into a copolymer to increase the electron transport capability of the polymer material. Given the teaching of the use of more than two monomer units in the copolymer, and the teaching of an oxadiazole monomer as a preferred co-monomer, it would have been obvious to one of ordinary skill in the art to use the oxadiazole monomer shown below in a copolymer as described above for the purpose of increasing the electron transporting capability of the polymer material.

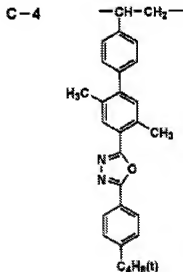


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23. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

24. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kita et al. (JP 2004185967).

25. Concerning claim 3, Kita et al. disclose the polymer material discussed above. Kita et al. further disclose copolymer comprising 3 monomers, where one (A) has the function of a luminescent host, one (B) has a hole transporting function, and one (C) has an electron transporting function. [0027] Monomers (A) include carbazole derivatives such as the one discussed above. Monomers (B) are triaryl amines, such as the ones discussed above, while monomers (C) are electron transporting, and include oxadiazole monomers, such as the one shown below [0074]. Kita et al. discloses that the materials are suitable hosts for phosphorescent dopants. (Abstract) [0027]

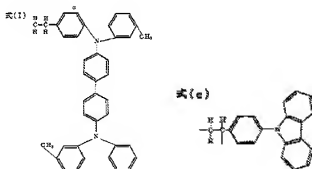


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26. Given the teaching by Kita et al. of a copolymer material comprising 3 monomers, including an electron transporting monomer such as the oxadiazole shown above, it would have been obvious to one of ordinary skill to synthesize the polymer where monomer (A) has the carbazole structure, monomer (B) has the triarylamine structure, and monomer (C) has an oxadiazole structure, and to predict that the material would function as a host for phosphorescent dopants, as described by Kita et al.
27. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

28. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakakibara (JP 2002124390)

29. Concerning claims 1-2, Sakakibara describes copolymer materials having on monomer having a first structure (I) shown below and a monomer having a second structure (e) shown below. (See example 3, [0043])



30. Sakakibara discloses that the material is suitable as a hole transporting material for an electroluminescent device (abstract). Sakakibara is silent on a copolymeric

material where the carbazole containing monomer has more than one aromatic or heteroaromatic ring between the carbazole and the polymer backbone. However, the function of the material is based in the carbazole portion of the material, which functions to transport holes. Therefore, it would have been obvious to one of ordinary skill to include a further aromatic ring between the carbazole ring and the polymer backbone and predict that the material would still function as a hole transporting material, particularly as a copolymer with the hole-transporting triarylamine portion.

31. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakakibara (JP 2002124390) (Sakakibara (JP)) as applied to claims 1 and 2 above, and further in view of Sakakibara et al. (US 6,872,474).

32. Concerning claim 3, Sakakibara et al. describe the polymer material discussed above, but are silent on the use of an oxadiazole containing monomer in the copolymer material.

33. Sakakibara et al. describe polymer materials as host materials for phosphorescent dopants, where the polymer material is a copolymer of a hole transporting material and an electron transporting material. (column 3, line 66-column 4, line 6) As hole transporting monomers, Sakakibara et al. describe polymerizable compounds such as aromatic tertiary amine compounds having a triphenylamine skeletal structure or carbazole skeletal structure (column 4, lines 14-22), both of which are described by Sakakibara (JP). The additional aromatic ring between the carbazole

and the polymer backbone would be predicted not to alter the hole transporting function of the carbazole material.

34. Sakakibara et al. further disclose preferably oxadiazole materials for the electron transporting monomer (column 4, lines 48-62). It is well known in the art to include electron transporting monomers into copolymer materials to increase the electron transport ability of the polymer materials.

35. Given this teaching, it would have been obvious to one of ordinary skill in the art to include an oxadiazole electron transporting monomer in the copolymer material described by Sakakibara (JP), which is known to conduct holes, for the purpose of increasing the electron transport ability of the material for use as a host material for phosphorescent dopants.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL E. NELSON whose telephone number is (571)270-3453. The examiner can normally be reached on M-F 7:30am-5:00pm EST (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael E. Nelson
Examiner
Art Unit 1794

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794